A.D. 1838 . . . . . . . N° 7841.

# SPECIFICATION

OF

## PAUL CHAPPÉ.

## FURNACES OF STEAM ENGINES, &c.

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## Furnaces of Steam Engines, &c.

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### CHAPPÉ'S SPECIFICATION.

**TO ALL TO WHOM THESE PRESENTS SHALL COME**, I, Paul Chappé, of Manchester, in the County of Lancaster, Spinner and Manufacturer, send greeting.

**WHEREAS** Her present most Excellent Majesty Queen Victoria, by Her Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Thirty-first day of October, in the second year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Paul Chappé, Her especial licence, full power, sole privilege and authority, that I, the said Paul Chappé, my executors, administrators, and assigns, and such others as I, the said Paul Chappé, my executors, administrators, and assigns, should agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England and Wales, and the Town of Berwick-upon-Tweed, my Invention of "Certain Improvements in the Means of Consuming Smoke, and thereby Economizing Fuel and Heat in Steam Engine or other Furnaces or Fire-places;" in which Letters Patent is contained a proviso that I, the said Paul Chappé, shall cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, to be enrolled in Her Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in pa recited Letters Patent, as in and by the same, reference being thereunto had will more fully and at large appear.

**NOW KNOW YE**, that in compliance with such proviso, I, the said Paul Chappé, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, is particularly described and ascertained in and by the Drawings hereto annexed, and the following explanation thereof, that is to say:—

My improvements in the means of consuming smoke and thereby economizing fuel and heat in steam engine and other furnaces or fire-places consist in the introduction of a thin sheet of boiling water, which is to be projected under the bottom of the boiler over the furnace fire in a continuous stream, and thus by proceeding over the fire in front of the bridge of the furnace prevents the escape of the smoke from ascending the flue or chimney, as the action of the water on the unconsumed combustible matter, which would otherwise escape in the form of smoke, occasions the whole to be burned so effectually as while it greatly increases the amount of heat usually evolved prevents at the same time the annoyance which unburned combustible matter must ever occasion. The water to be employed for effecting the above purpose must be heated to two hundred and twelve degrees of Fahrenheit's thermometer, that is, at or near the boiling point, and is to be projected into the furnace by any suitable mechanical means; but as the small apparatus which will be required for the purpose must necessarily be slightly varied in its construction, and so modified in its application in order to be suitably adapted to whatever arrangement of furnace or fire-place in which it may be used, I have attached to these Presents a Drawing, in which I have represented such an apparatus as will be required to effect its application to the ordinary furnace of a low pressure steam boiler, and which Drawing will also sufficiently illustrate its adaptation to other furnaces or fire-places. In the accompanying Drawing Figure 1 represents a sectional elevation taken longitudinally of an ordinary steam engine furnace and boiler with a pipe suitably attached to the same, through which the stream of boiling water is to be projected. Figure 2 is a horizontal or plan view of the same; and Figure 3, a vertical cross section taken immediately in front of the boiler. It will be observed that similar letters of reference are marked upon corresponding parts in all the Figures. *a*, *a*, represents the grate or fire bars of the furnace; *b*, the bridge; and *c*, *c*, *c*, the ordinary flues leading to the chimney. *d*, *d*, *d*, *d*, is the boiler; *e*, the feed pipe; and *f*, the steam pipe. The only mechanical contrivance which is necessary for carrying my Invention into effect is the insertion of a small pipe or tube *g*, *g*, into the interior of the boiler, and it is most simply introduced through the side, as represented in Figure 1. This pipe or tube must have its upper end open, and just below the ordinary height of the low water line in the boiler, so that

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1 SHEET

FIG. 2.

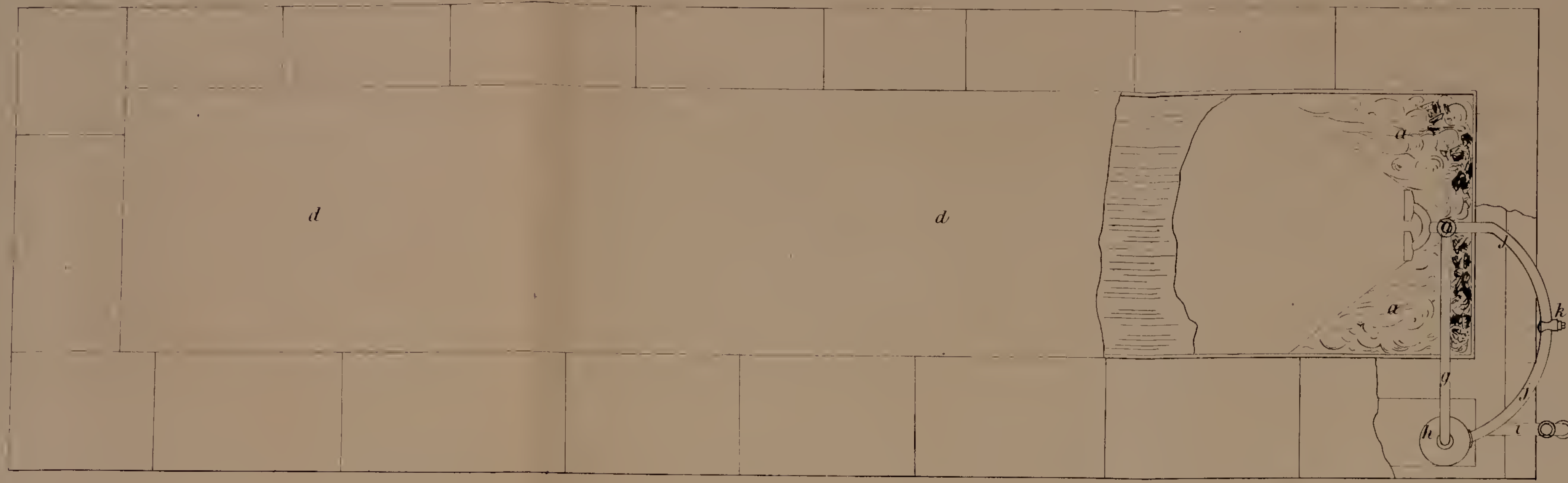


FIG. 4.

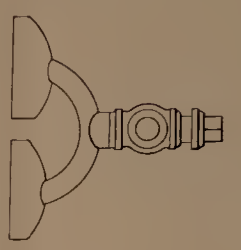


FIG. 5.

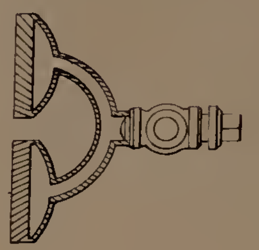


FIG. 1.

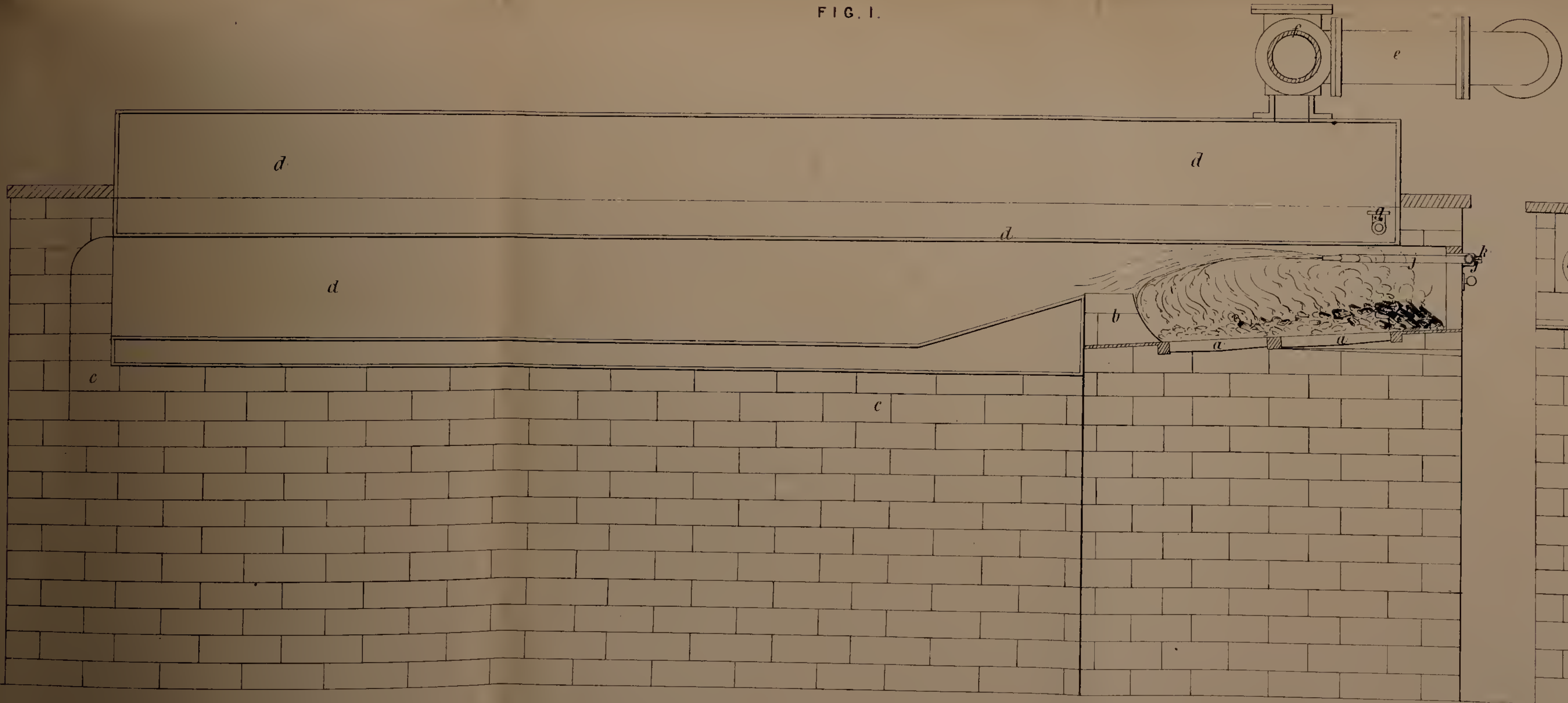
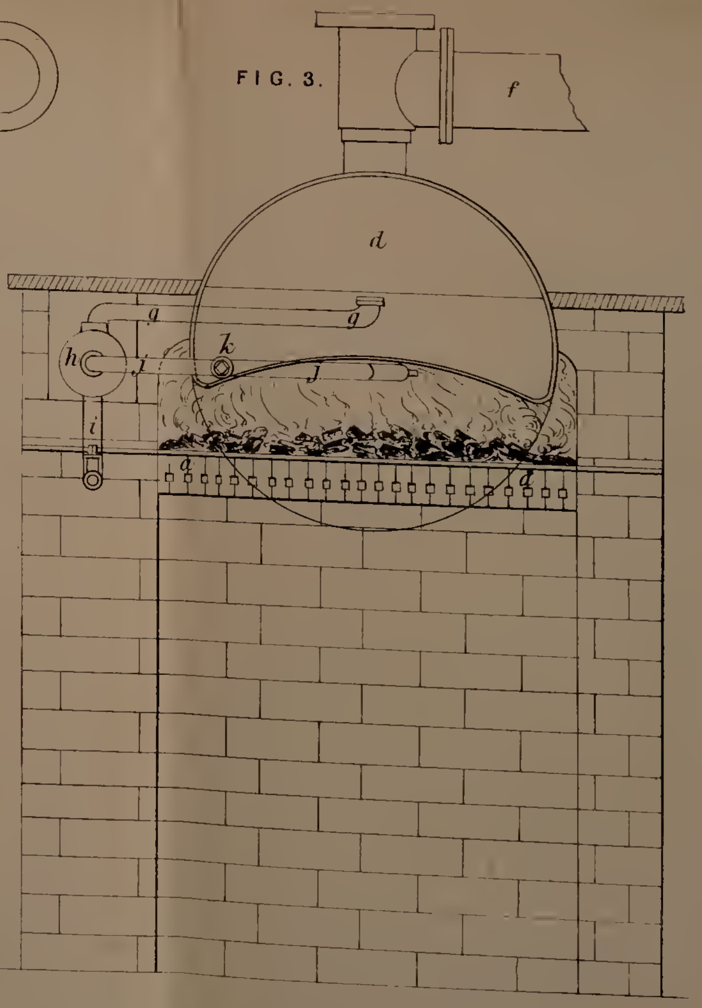


FIG. 3.



The enrolled drawing is colored.

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Malby & Sons, lith.

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the pressure in the boiler will be sufficient to force the water down the pipe *g*, and to project the water into the furnace. This pipe is furnished with a vessel or receptacle *h*, for the purpose of receiving any deposit of mud or other matter which may precipitate from the water. *i* is a pipe and tap through which such deposit may be removed from the vessel *h* at suitable intervals; another pipe *j* also proceeds from the vessel *h*, which is provided with a regulating stop-cock *k* in front, and terminates within the furnace close under the boiler in a mouth-piece consisting of one or more branches, as represented in Figures 4 and 5. This mouth-piece or mouth-pieces are constructed of brass, and pierced with fine holes to admit of the passage of the water, and are screwed to the pipe *g*. These holes being pierced or bored in radial directions diverging from the centre of the pipe, as shewn in the detached Figure 5, will assist the operation by spreading the sheet of water above the surface of the fire, when by the inflammation of the gases evolved by the decomposition of the water the smoke will be readily consumed, and thus cause a considerable economy of fuel employed in the generation of the steam.

These improvements in the consumption of smoke, besides having for their principal object the saving of fuel, have also a considerable advantage in being applied to boilers used for the generation of steam; as the peculiar and requisite situation of the pipe *g*, by being just below the low water mark of the boiler will thus serve as an indication of the quantity of water in the boiler, and thus exhibit any liability to burn out or burst, for as the water-line falls below the mouth or upper end of the pipe *g*, the water will no longer be projected over the surface of the fire, and thus smoke will issue from the chimney and warn the engineer of the approach of danger. It is also very advisable to have a small sheet or stream of hot water projected in a similar manner either at the end of the flues or in the chimney, in order most effectually to destroy such smoke or other combustible matter which may have escaped over the bridges of the furnace during the operation of firing or any casual opening of the fire doors. The supply pipes in such cases may be taken from the end of the boiler next the chimney or flue. In the application of this Invention to other furnaces or fire-places than those used under steam boilers, the water must be supplied to the pipe which is to project it over the fire from any convenient cistern or tank in suitable connexion with such furnaces of fire-places, and heated to the required degree, being projected by its own gravitation.

Having now particularly described my Invention of improvements in the means of consuming smoke, I desire it to be particularly understood that, as I have before stated, the apparatus or pipes must be always modified and constructed to suit the peculiar position and application of the same, and that I have shewn in the Drawings, for the sake of illustration, the best practical mode of applying the same to an ordinary boiler for a stationary steam engine, and which I have found to have the desired effect; yet as the circumstances of its application must vary, and may be adapted by competent mechanics in many different modes, I claim as my Invention the projection of a thin sheet or stream of hot water or a shower of hot water over the surface of the fire, or in the flues or chimneys, (the water being at or near the heat of two hundred and twelve degrees of Fahrenheit's thermometer,) and its application to the furnaces of stationary, marine, or locomotive steam engines, and all other furnaces and fire-places where the said Invention may be applied.

In witness whereof, I, the said Paul Chappé, have hereunto set my hand and seal, this Twenty-seventh day of April, in the year of our Lord One thousand eight hundred and thirty-nine.

PAUL (L.S.) CHAPPÉ.

**AND BE IT REMEMBERED**, that on the Twenty-seventh day of April, in the second year of the reign of Her Majesty Queen Victoria, the said Paul Chappé came before our said Lady the Queen in Her Chancery, and acknowledged the Instrument aforesaid, and all and everything therein contained and specified, in form above written. And also the Instrument aforesaid was stamped according to the tenor of the Statute made in the fifty-fifth year of the reign of His late Majesty King George the Third.

Aston, Extra.

Inrolled the Thirtieth day of April, One thousand eight hundred and thirty-nine.

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